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09/072,784	05/06/1998	BARIN GEOFFRY HASKELL		6905

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EXAMINER	
CHEN, WENPENG	
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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/072,784	Applicant(s) HASKELL ET AL.	
	Examiner Wenpeng Chen	Art Unit 2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *01 October 2001* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-38* is/are pending in the application.

4a) Of the above claim(s) *16-19 and 23* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-15, 20-22, 24-38* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 10/01/2001 has been entered.

Examiner's responses to Applicant's remark

2. Applicants' arguments filed on 10/1/2001 have been fully considered but they are not persuasive. The Examiner has thoroughly reviewed Applicants' arguments but firmly believes that the cited reference to reasonably and properly meet the claimed limitation.

3. The amendment overcomes the rejection of Claims 4-7 under 35 U.S.C. 112, second paragraph set forth in paper #6.

4. Responses to arguments

a. Applicants' argument -- For Claims1 and 24-25, Chang does not teach "assigning a priority to the video object layer data of each video object." The Examiner corresponded frame GOP to video object layer. Change's discussion of priorities extends only to his video objects, not to his groups of pictures.

b. Examiner's response -- The Examiner does not agree with the conclusion. The passage in column 4, lines 15-41 and Fig. 4 definitely teach "assigning a priority to the video object layer data of each video object." For example, the table in Fig. 4 lists 4 objects (A to D). The objects data associated with a group form a video object layer. The priority of each object is assigned in the first number of the pair in the parentheses. In Group i, the priorities for video object layers A, B, C, and D are assigned as 1, 3, 2, and 3 respectively. In each video object layer, the priorities are then assigned according I, P, and B frames.

c. Applicants' argument -- For Claim 11, Chang does not teach assigning the priority based on the importance carried in the video object layer.

Examiner's response -- The passage (column 3, lines 57-67) cited in paper #6 clearly shows the teaching.

d. Applicants' argument -- For Claim 15, Chang does not teach the first and second priorities and the second priority is lower than the first priority.

Examiner's response -- The table shown in Fig. 4 in Chang teaches that the data is transmitted according to the first priority at first. With the data in the selected video object layer, the data is then transmitted according to the second priority.

e. Applicants' argument -- The 103 rejection based on Das et al. (US patent 5,896,176) in view of Chang et al. (US patent 6,025,877) is improper, because says nothing about video object layers.

Examiner's response -- In the summary section (column 3, lines 63-68,) Das clearly point out the use of object scalability, i.e. controlling the number of objects to be coded. Object

scalability is the essential concept of the present application and is the approach used in both Das and Chang. Thus the combination is proper.

Specification

5. The attempt to incorporate subject matter into this application by reference to US application 08/986,118 is improper because it has been abandoned.

Claim Rejections - 35 USC § 112

6. Claims 31-33 and 36-38 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

-- Claims 31 and 36 call for the limitation of "causal VOPs are assigned to a first VOL and non-causal VOPs are assigned to a second VOL." The limitation is not taught in the specification. The specification is silent in assigning any I, P, or B VOPs to different VOLs, wherein B VOP is non-causal.

-- Claims 32 and 37 call for the limitation of "intra-coded VOPs and predictive coded VOPs are assigned to a first VOL and bi-directional predictive-coded VOPs are assigned to a second VOL." The limitation is not taught in the specification. The specification is silent in assigning any I, P, or B VOPs to different VOLs.

-- Claims 33 and 38 call for the limitation of "the data of a single VOL is transmitted as a continuous burst of data." The limitation is not taught in the specification.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

8. Claims 1, 4-5, 7, 11, 14-15, 22, 24-25, and 28 are rejected under 35 U.S.C. 102(e) as being anticipated by Chang et al. (US patent 6,025,877 cited previously.)

Chang teaches a method of encoding a video data stream, comprising the steps of:

-- identifying video objects (VO) from a video data stream; (Fig. 2, element 21; column 3, lines 10-26)

-- coding each video object as video object layer (VOL) data and video object plane (VOP) data; (Fig. 2, elements 12; column 3, lines 10-26; It is clearly seen that VOPs are coded in Fig. 2. The passages in column 1, line 58-62 and column 4, lines 18-27 teach that the video objects are coded as VOL, too.)

-- assigning a priority to the video object layer data of each video object; (Fig. 2, element 21; column 3, lines 10-26; column 4, lines 15-41 and Fig. 4)

- wherein the priority is assigned based on the importance of the information contained in the VOL data; (column 3, lines 57-67)

-- assigning a second priority to each from a plurality of VOPs of a video object and including the second priorities in the encoded bitstream; (column 4, lines 27-35; The I, P, and B are the second kind of priority.)

-- encoding the video object layer data, the video object plane data and the priority data in the bitstream; (column 1, lines 25-34)

-- wherein information related to VOL data having a high priority is transmitted before information related to VOL data having a low priority; (column 3, lines 57-67)

-- the bitstream is output to a channel in which the priority is used to identify some data which may be discarded in the event of channel congestion, loss of channel bandwidth, or limited process resources. (column 3, lines 32-40, 58-64; Fig. 5; Fig. 5 teaches to transmit parts of information according to the priority and according to various conditions. A low current transmission speed is an indicator of channel congestion. The transmission speed in a network assigned to the system is varied. When the speed is reduced, the channel bandwidth is lost. It is also representing a limitation to the overall process resource of the receiving part.)

Chang also teaches a method of decoding a video data stream, comprising the steps of:

-- receiving an encoded bitstream, the encoded bitstream containing VOL data and VOP data corresponding to a VO, the VO identified from a video data; (Fig. 2; column 3, lines 10-32)

-- identifying a first VOL and a second VOL in the encoded bitstream, the first VOL having the first priority and the second VOL having the second priority lower than the first

priority; (Fig. 2; column 3, lines 10-32, lines 58-68; Because the bitstream is transmitted in the order of the priority of VOLs. The VOLs with their priorities are identified.)

-- decoding the first and second VOLs to reconstruct video information contained in the bitstream. (Fig. 2; column 3, lines 10-32, lines 58-68)

Claims 24 and 25 are the corresponding apparatus claims of the method Claims 1 and 15, respectively. Fig. 2 teaches the coding system of Claim 24 and decoding system of Claim 25 with the parts to carry out the steps cited above. Claims 24 and 25 are similarly rejected.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

10. Claims 1-3, 8-10, 12-13, 20-21, 26-27, 29, 33-34, and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Das et al. (US patent 5,896,176 listed in paper #3) in view of Chang et al. (US patent 6,025,877.)

Das teaches a method of encoding video information, comprising the steps of:

-- identifying VOs from a video data stream; (column 11, lines 32-37 and 55-63; column 12, lines 42-59; column 14, lines 43-53.)

-- coding each VO as VOL data and VOP data; (column 14, lines 38-53; column 14, lines 35-53; column 15, lines 1-8 and 28-66; Fig. 5c; The objects in the I, P, P sequence forms a video object layer. The object in each frame is a VOP. When an object is assigned to be interest, an associated video object plane is formed as shown in Fig. 5c.)

-- assigning a priority to the regions of interest which can be objects; (column 11, lines 55-63; the map indicating priorities; column 12, lines 42-59)

- wherein the step of assigning the priority is optional; (The language in Claim 8 makes an alternative limitation: the step is performed or not performed. As discussed above, the step being performed thus meets the requirement. Furthermore, the manipulation and scalability recited in column 2, lines 13- 36 inherently teach that the step can be selectively not performed.)

-- encoding the VOL data, the VOP data, and the priority data in a bit stream; (column 11, lines 32-37 and 55-63; column 15, lines 1-8 and 28-66)

- wherein the video information is coded into a bitstream for low bitrate transmission; (column 3, lines 62-67)

- wherein the coding is performed according to the MPEG-4 standard; (column 4, lines 1-3)

- wherein the bitstream is a visual bitstream and the assigned priories of data is carried out by a specific codeword; (column 11, lines 55-63; column 17, lines 30-55; A video bitstream is a visual bitstream. The priority map is at least represented by binary numbers which are specific codewords.)

- wherein the bitstream is a systems bitstream and the assigned priories of data is included as part of an object descriptor in the systems bitstream; (column 12, lines 43-59;

Because the region of interest could be macroblocks covering objects, the priority map is included as part of the contour map which is an object descriptor. The passage in column 17, lines 30-55 indicates that the bit stream is a systems bitstream.)

-- wherein the step of assigning a priority is performed based on the importance of the information contained in the element; (column 12, lines 42-59)

-- wherein elements having a high priority is performed before being performed for element having low priority; (The passage in column 11, lines 32-37 teaches selecting a region for coding. The passage inherently teaches a region of higher priority is coded first. The passage in column 11, lines 55-30 teaches that more than two priorities are assigned to regions. Even if the lowest region is not coded, there are at least two regions to be coded. The region of highest priority is always selected to be coded before the region of the second high priority.)

-- wherein encoding of elements having a low priority is not performed; (column 11, lines 55-63)

-- transmitting the bitstream, wherein information related to elements having a high priority is transmitted before information related to elements having a low priority. (transmission channel in Fig. 1; The passage in column 17, lines 30-53 teaches the required transmission sequence. The high priority data of the first object is sent first.)

Das also teaches the corresponding method of decoding encoded bitstream, comprising the steps of:

-- receiving the encoded bitstream, the encoded bitstream containing VOL data and VOP data corresponding to a VO, the VO identified from a video stream; (Fig. 1)

-- identifying a first VOL and a second VOL in the encoded bitstream, the first having a first priority and the second having a second priority lower than the first priority; (column 16, lines 39-45; column 15, lines 12-21; column 13, line 63 to column 14, line 18; column 7, lines 4-17; It is also well known in the art that a decoder is a mirror image of an encoder. All of the specific data attributes generated in an encoder are all inherently transferred to the corresponding decoder. The shape information provides the identification. For example, the lady and the background are the first and second elements, respectively.)

-- decoding the first VOL to reconstruct video information contained in the bitstream; (column 16, lines 39-45; column 15, lines 12-21; column 13, line to column 14, line 18; column 7, lines 4-17)

- wherein the bitstream is a visual bitstream and the assigned priories of data is carried out by a specific codeword; (column 11, lines 55-63; column 17, lines 30-55; A video bitstream is a visual bitstream. The priority map is at least represented by binary numbers which are specific codewords.)

- wherein the bitstream is a systems bitstream and the assigned priories of data is included as part of an object descriptor in the systems bitstream. (column 12, lines 43-59; Because the region of interest could be macroblocks covering objects, the priority map is included as part of the contour map which is an object descriptor. The passage in column 17, lines 30-55 indicates that the bit stream is a systems bitstream.)

Das also teaches the corresponding medium that stores the instruction to carried out the above cited encoding and decoding steps. (Column 5, lines 11-23)

Although Das assigns a priority to a VO which can be considered as assigning a priority related to a VOL. However, Das does not explicitly assign a priority to VOL data and code VOL according the priority, because Das does not explicitly teach to code and transmit in the order of a set of VOPs which form a VOL.

Chang teaches a method of encoding a video data stream as discussed above, specifically comprising the steps of:

-- assigning a priority to the video object layer data of each video object; (Fig. 2, element 21; column 3; lines 10-26)

-- wherein information related to VOL data having a high priority is transmitted before information related to VOL data having a low priority. (column 3, lines 57-67)

It is desirable to receive fully the important information in the environment of variable transmission speed. It would have been obvious to one of ordinary skill in the art, at the time of the invention, to apply Chang's teaching of assigning a priority to the VOL (the I, P, P, sequence) of each VO of Das' data bitstream and to encode and transmit the VOLs according to the priority, because the combination optimizes the received image quality by receiving and decoding the VOL according to the priority. In the combination, the VOL of high priority is encoded before the VOL of low priority. In some situation, the VOL of low priority is not encoded, because it is not to be transmitted. Also, the priority data are carried out by the codeword and included as part of an object description of Das' system.

As cited and discussed above, the combination also teaches the newly added Claims 29 and 34.

For Claims 33 and 38, the data of a single VOL is transmitted as a continuous burst of data, because each GOP is transmitted continuously.

11. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chang et al. (US patent 6,025,877) as discussed above, and further in view of Sikora ("The MPEG-4 Video Standard Verification Model," Thomas Sikora, IEEE Transactions on Circuits and Systems for Video Technology, vol. 7, no. 1, February 1997, pages 19-31 cited previously.)

Chang teaches the parental Claim 1 as discussed above. Chang also teaches that the priority is used to identify some data which may be discarded in the event of channel congestion, loss of channel bandwidth, or limited process resources.

However, Chang does not teach that the priority data identifies which video object layer data may be discarded in the event of channel errors.

Sikora teaches a method of encoding a video data stream, comprising the steps of:

-- the bitstream is output to a channel in which some data may be discarded in the event of channel error. (pages 19-20; right column, page 23; the paragraph bridging the two columns in page 24; Content-based scalability decides data to be discarded. The robustness in noisy environment indicates MPEG-4's application in the event of channel error. The first paragraph in page 20 specifically recites application of the content-based scalability in the noisy environment.) That means that the objects are selectively processed and transmitted.

It is desirable to code an image and receive fully the important information in the various environments, including a noisy environment having channel error. It would have been obvious to one of ordinary skill in the art, at the time of the invention, to apply Sikora's content-based

scalability in a noisy environment to use the priority to identify which VOLs of Chang's system may be discarded, because the combination optimizes the received image quality in an environment with channel error by receiving and decoding the VOL according to the priority.

12. Claims 31-32 and 36-37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Das et al. (US patent 5,896,176 listed in paper #3) in view of Chang et al. (US patent 6,025,877) as applied to Claims 29 and 34 above, and further in view of Eifrig et al. (US patent 6,005,980.)

Das in view of Chang teaches Claims 29 and 34. Das further teaches quality scalability by using base layer and enhancement layer. (column 16, lines 46-64) However, The combination does not explicitly state that the enhancement layer is bi-directional predictive-coded VOPs.

Eifrig teaches that:

-- intra-coded VOPs, predictive coded VOPs, bi-directionally predictive-coded VOPs are data of three types of video data. (column 6, lines 32-63) In the MPEG-4 Video Verification Model, intra-coded VOPs, predictive coded VOPs, bi-directionally predictive-coded VOPs can be assigned to different priority in the temporal scalability.

It is desirable to code an image to minimize the restriction of a transmission capacity. The objective can be achieved with temporal scalability. It would have been obvious to one of ordinary skill in the art, at the time of the invention, to combine the teachings of Eifrig , Das, and Change to assign intra-coded VOPs and predictive coded VOPs to a first VOL and assign bi-directionally predictive-coded VOPs to a second VOL, because the combination further improve the scalability of data transmission.

13. Claims 30 and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Das et al. (US patent 5,896,176 listed in paper #3) in view of Chang et al. (US patent 6,025,877) as applied to Claims 29 and 34 above, and further in view of Suzuki et al. (US patent 6,097,842.)

Das in view of Chang teaches Claims 29 and 34. Das further teaches that (1) various priorities can be given to different regions of interest (column 11, lines 55-63) and (2) the region of interest can be selected based on objects for scalable compression (column 12, lines 42-52.) Thus, it would have been obvious to one of ordinary skill in the art, at the time of the invention that when there are more than seven objects in a picture, seven priorities can be assigned. Under the situation, a priority field for video-object-layers taught by Das in view of Chang can be set to have a length of three bits, taking values between 1 and 7, where 1 represents a highest priority and 7 represents a lowest priority.

However, Das in view of Chang does not teach a flag to indicate whether priority is set for the VOL or not.

Suzuki teaches:

-- a flag, having a length of one bit that, when set to "1," indicates that priority is specified for scalability. (A3 in Table 35; column 31, lines 42-46)

It is desirable to decoder an image more efficiently. The objective can be achieved with a flag to indicate a VOL is coded with object scalability or not. It would have been obvious to one of ordinary skill in the art, at the time of the invention, to combine the teachings of Suzuki, Das, and Change to assign an is-video-object-layer-identifier flag to indicate whether VOL taught by Das and Change has object scalability or not. The combination can speed up decoding process

because when a VOL is indicated no object scalability is used, the steps associated with determination of priorities can be bypassed.

Conclusion

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Wenpeng Chen whose telephone number is 703 306-2796. The examiner can normally be reached on 8:30 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David K Moore can be reached on 703 308-7452. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9314 for regular communications and 703-872-9314 for After Final communications. TC 2600's customer service number is 703-306-0377.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703 305-4700.

Wenpeng Chen
Primary Examiner
Art Unit 2624

December 4, 2001